



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,388	10/05/2006	Troy Scoggins	3194.1003-009	1275
21005 7590 12/12/2008 HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133				
EXAMINER				
NGUYEN, NGOC YEN M				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
12/12/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/593,388

Applicant(s)

SCOGGINS, TROY

Examiner

Ngoc-Yen M. Nguyen

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) 29-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 and 52-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 09/18/08 and 07/30/07
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Applicant's election of Group I in the reply filed on November 3, 2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 29-51 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on November 3, 2008.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: for Figure 1, liquid port 20 in the cover 14 is described on page 14 of the instant specification, however, no liquid port "20" is shown. It should be noted that in Figure 1, the liquid port in cover 14 appears to be designated as "26" and "26" is also designated as "purified liquid stream" (note the objection below) and "20" is a media retention device. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If

the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "26" has been used to designate both liquid port (in cover 14) and purified liquid stream (from liquid port 22). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The disclosure is objected to because of the following informalities: on page 6, last paragraph, the ratio between alumina and silica is first described as "silica-to-alumina mole ratio" (note lines 21-22), but then described as "alumina-to-silica mole ratio" (note lines 24 and 26). It is unclear which the correct ratio is.

Appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 9, 53, 54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 3, 9, 53-54, it is unclear if the ratio is mole ratio or weight ratio.

In claim 9, "if" is misspelled. Claim 9 is a duplicate claim of claim 3.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 9, 17, 21-22, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Bothe Almquist '742.

Bothe Almquist '742 discloses a process for purifying halosilanes by contacting a liquid mixture comprising a halosilane and a hydrocarbon with an adsorbent selective for the hydrocarbon, thereby reducing the hydrocarbon content of the mixture (note claim 1). The halosilane can be tetrachlorosilane, SiCl_4 (note claim 7). The adsorbent can be high silica zeolites (note claim 5). The process can be carried out as a continuous process (note claim 4).

The "high silica zeolite" fairly teaches that the silica to alumina ratio is at least about 5.

The process of Bothe Almquist '742 anticipates the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-17, 21-23, 27-28, 52-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bothe Almquist et al (5,445,742).

Bothe Almquist '742 discloses a process as stated in the above rejection.

For claim 28, it would have been obvious to one skilled in the art to use any suitable housing to carry out the contacting step as disclosed in Bothe Almquist '742 as long as the hydrocarbon impurities can be removed.

Bothe Almquist '742 does not specifically disclose the properties of the zeolite used as the adsorbent, such as particle size, pore size, etc.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select a suitable zeolite, with appropriate properties, such as particle size, pore size, etc. for the process of Bothe Almquist '742 in order to sufficiently remove hydrocarbon impurities from a halosilane such as silicon tetrachloride.

The use of more than one of suitable zeolites for the same purpose would also have been well within the skill of the artisan.

Claims 15-16 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bothe Almquist '742 as applied to claims 1-17, 21-23, 27-28, 52-55 above, and further in view of McIntyre et al (6,168,652).

The difference not yet discussed is Bothe Almquist '742 does not disclose the use of a silica gel.

McIntyre '652 discloses a process for purifying halosilanes by contacting a mixture comprising a halosilane and a hydrocarbon with silica gel, thereby reducing the hydrocarbon content of the mixture (note claim 1). The mixture can be a liquid (note the sentence bridging columns 2-3). The halosilane can be tetrachlorosilane (note column 2, lines 19-25).

For a process of removing hydrocarbon impurities from a halosilane, zeolite and silica gel are analogous adsorbents.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a combination of zeolite and silica gel as adsorbents to remove hydrocarbon impurities from a halosilane such as silicon tetrachloride because it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

McIntyre '652 can be further applied to teach that chlorosilanes readily hydrolyze on contact with water, it may be necessary to at least partially dry the silica gel prior to

use. Drying of the silica gel can be effected by standard methods known in the art such as by heating under reduced pressure (note column 2, lines 57-62).

When zeolite is also used as the adsorbent, it would have been obvious to one skilled in the art to subject the zeolite to the same drying step as stated above in order to reduce the amount of moisture in the zeolite, as suggested by McIntyre '652 in order to prevent the hydrolyzing reaction between the chlorosilanes and the water.

Claims 1-16, 18-19, 21-28, 52-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dukhedin-Lalla et al (2006/0133986) in view of Kirsch et al (4,557,921) and optionally further in view of Atobe et al (2004/0184980).

Dukhedin-Lalla '986 discloses a process for removing hydrochloric acid impurities present in a binary halide fluid comprising contacting the binary halide fluid with an adsorbent polymer (note claim 1).

The binary halide fluid contains a molecularly dispersed oxide impurity and the process further comprises contacting the binary halide fluid with a second adsorbent, said second adsorbent (note claim 3). The binary halide can be SiF_4 , the oxide impurity can be CO_2 , CO , H_2O , oxides of nitrogen, oxides of sulfur, etc. (note claim 4). The second adsorbent can be zeolites, molecular sieves (note claim 11).

The binary fluid can be a gas or a liquid (note paragraph [0046]). The polymer and the zeolite can be put in the same chamber so that the binary halide can contact with both simultaneously (note paragraphs [0053] and [0054]).

Dukhedin-Lalla '986 discloses that after the purification step, the SiF_4 can be used in electronic component manufacturing and the SiF_4 is considered as electronic-grade which contains impurities such as CH_4 , CO_2 , As, P, B, etc. (note paragraphs [0022]-[0031]). This fairly teaches that the crude SiF_4 , before the purification step, would contain at least all the same impurities but at higher amounts.

The differences are Dukhedin-Lalla '986 does not disclose (1) the properties of the zeolite and the use of silica gel.

For (1), Kirsch '921 discloses a process for removal of hydrogen halides and/or sulfur dioxide from silicon tetrafluoride by contacting silicon tetrafluoride with an acid stable zeolite (note claim 1). The zeolites can be zeolites of types Y (note column 8, lines 42-43) and in hydrogen cation form (note column 4, lines 13-18). Modernite (hydrogen cation form) is used in Example 1 and modernite is described as having silica to alumina molar ratio of about 10 (note column 1, lines 1-20).

For other properties of the zeolites, such as particle size, pore size, it would have been obvious to one of ordinary skill in the art to select zeolites with appropriate properties to facilitate the removal the impurities from silicon tetrafluoride.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Y-type zeolite with high silica to alumina ratio and in hydrogen form for the process of Dukhedin-Lalla '986 because Kirsch '921 suggests that such zeolite is preferred for removing hydrogen halides and/or sulfur dioxide from silicon tetrafluoride.

For difference (2), Atobe '980 discloses that for removing CO, CO₂, zeolite and silica gel are considered as analogous adsorbents (note paragraph [0070]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use silica gel in addition of zeolite in the process of Dukhedin-Lalla '986, as suggested by Atobe '980, note In re Kerkhoven as stated above.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/
Primary Examiner, Art Unit 1793

nmn
December 13, 2008